EFFECTIVENESS OF ISCHEMIC COMPRESSION TECHNIQUE AND TAPING TECHNIQUE TO REDUCE PAIN IN LEVATOR SCAPULAE TRIGGER POINT RELATED NECK PAIN

A dissertation submitted in partial fulfillment of the requirement for the degree of

MASTER OF PHYSIOTHERAPY

(ELECTIVE – PHYSIOTHERAPY IN ORTHOPAEDICS)

To

The Tamil Nadu Dr. M.G.R. Medical University

Chennai – 600 032

April 2013

(Reg. No.27111021)

RVS COLLEGE OF PHYSIOTHERAPY

(Affiliated to the Tamil Nadu Dr. M.G.R Medical University, Chennai – 32)

SULUR, COIMBATORE – 641 402

TAMIL NADU, INDIA

CERTIFICATE

Certified that this is the bonafide work of Mr. K. ARUN of R. V. S. College of Physiotherapy, Sulur, Coimbatore submitted in partial fulfillment of the requirements for Master of Physiotherapy Degree course from the Tamil Nadu Dr. M. G. R. Medical University under the Registration No: 27111021.

ADVISOR

Mrs. L.Vinola M.P.T

Professor,

RVS College of Physiotherapy,

Sulur, Coimbatore.

PRINCIPAL

Prof. Mrs. R. Nagarani, M. P. T., M. A., (Ph. D.),

RVS College of Physiotherapy,

Sulur, Coimbatore.

Place:

Date:

EFFECTIVENESS OF ISCHEMIC COMPRESSION TECHNIQUE AND TAPING TECHNIQUE TO REDUCE PAIN IN LEVATOR SCAPULAE TRIGGER POINT RELATED NECK PAIN

INTERNAL EXAMINER:

EXTERNAL EXAMINER:

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR

THE DEGREE OF "MASTER OF PHYSIOTHERAPY"

AT

THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI

APRIL 2013

DECLARATION

I hereby declare and present my thesis work entitled **"EFFECTIVENESS OF ISCHEMIC COMPRESSION TECHNIQUE AND TAPING TECHNIQUE TO REDUCE PAIN IN LEVATOR CAPULAE TRIGGER POINT RELATED NECK PAIN".**

The outcome of original research work undertaken and carried out by me, under the guidance of **Mrs. L.Vinola M.P.T R.V.S. College of Physiotherapy,** Sulur, Coimbatore.

I also declare that the material of this project work has not formed in anyway the basis for the award of any other degree previously from the Tamil Nadu Dr. M. G. R. Medical University, Chennai.

Place: SIGNATURE

Date:

ACKNOWLEDGEMENT

First of all I want to acknowledge the almighty, who has given me the required knowledge, wisdom, strength and opportunity to do this project successfully.

I would like to express my gratitude to our principal Mrs. R. Nagarani, M. P. T., M.A., (Ph.D), for providing me constant support and motivation in the form of resources and inputs.

I owe my sincere thanks to **Prof. Mrs. L.Vinola M.P.T ,** my guide for her inspiration, assistance and support, from the inception of this research study to its completion.

I am grateful to all patients who rendered their valuable co-operation during my data collection.

I'm thankful to all my friends for their support. And last but not least I would like to acknowledge my parents, my collegues for their unconditional support and encouragement to pursue higher aspirations. Many people, directly or indirectly, knowing or without knowing the importance of their contribution, helped for the realization of this research.

CONTENTS

VII ANNEXURE

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

OBJECTIVE: To find out the effectiveness of taping and ischemic compression technique to reduce pain in levator scapulae trigger point related neck pain

DESIGN: This study is an experimental with pre test and post test evaluation.

PARTICIPATION: 20 subject aged 22-45 years neck pain patients are selected, the client were treated by ischemic compression and taping techniques.

OUTCOME MEASURES: The outcome was measured using visual analogue scale , and active Range of cervical spine rotation measure by goniometer.

RESULTS: Statistical analysis done by using paired ‘t’ test showed that that there was significant improvement in subject who underwent the treatment of taping and ischemic compression technique.

CONCLUSION: Hence, it is concluded that the taping and ischemic compression technique to reduce pain in levatorscalpulae trigger point related neck pain.

I. INTRODUCTION

Neck pain is the common problem in all over the countries. It occurs any age group Individuals due to many causes like trauma, poor posture, pathological and ergogenic problems.

Levator scapulae muscles trigger points also produce neck pain and shoulder pain.Levator scapulae located on each side of the neck situated posteriorly. It named for its action in“ Elevating” or “lifting” the scapulae. In Greek word , Levator means “To lift”. Levatorscapulae muscle arise from posterior tubercle of transverse process of first four cervical vertebrae. It is inserted into the medial border of superior angle of scapulae. Levator scapulae muscle is blood supplied by dorsal scapular artery and nerve supply is third, fourth cervical nerve and Dorsal scapular nerve(C5). Levator muscles act along with trapezius to shrug the shoulder by its raising of the Scapula. If the scapula fixed the muscle assist in cervical extension and used alone flex the neck Laterally to one side.

Levator scapulae trigger point are frequently produce stiff neck because of markedly limited neck movements. Myofascial trigger point in levator scapulae muscle can be activated and perpetuated by Occupational activities such as typing, with the head and neck turned to look towards one side of the type writer, making long telephone calls ,and taking length with head turned toward someone sitting by one side. Vigorous exercise that involved head turning such as playing tennis or swimming when out of shape; The repetitive rotation of the head as in “spectator neck” using a cane or crutches that are too long, Improper positioning, Flattend arch foot, Nutritional in adequacies such as Folic acid, Vitamin $B_{2,}$ $B_{6,}$ $B_{12,}$Vitamin C deficiency, Metabolic, Endocrine inadequacies. Psychological factors such as depression, good sport syndrome, chronic

infections. Others factor such as impaired sleep, Radiculopathy, prolonged immobility also produce or activate Trigger points.

Trigger points are “A highly irritable localized spot of exquisite tenderness in nodule in a taut band of skeletal muscle” (Travell,simon 1999).

Trigger points develop in the myofascia, mainly in the center of the muscle belly where the motor end plate enters. However , secondary or satellite trigger point after develop in a response to a primary trigger point. These satellite trigger point tend to develop along the line of the stress. These line of stress may be built in at the time of embryogenesis. The trigger point causes muscle to be sore, stiff, weak, and less flexible, and may trigger sensory, motor and autonomic phenomena.

The Trigger points are classified as central or primary Trigger point, satellite or secondary Trigger point, Attachment Trigger point, Diffuse Trigger point, Inactive or latent Trigger point, Active Trigger point. The theories of Trigger point:

1. Motor end plate theory
2. Energy crisis theory
3. Radiculopathic theory
4. Polymodel theory (PMRS)

Levator scapulae is a postural muscle. Levator scapulae develops trigger point tenderness in two locations. Central trigger points are at the where the muscle emerges from beneath the anterior border of the upper trapezius and much more readily identified secondary area where the muscle attaches to the superior angle of scapula. So the poor posture is a powerful “activator and perpetuator” of Trigger points. The involved muscle may be stiff and weak and may be restricted in range of motion.

The Pain from trigger point activities in this muscle is mainly felt at the base of the neck, but it also extended upwards towards the occiput; Outward to the back of the shoulder and downwards along the inner border of the scapula.

The pain may also radiate interiorly around the chest wall along the course of the fourth and fifth intercostal nerve when it may erroneously be diagnosed as being either anginal or pleural or even more frequently as being due to intercostal nerve entrapment.

Trigger point examination by palpation of the muscle as it emerges from beneath the trapezius at the angle of neck dislodges it most important central trigger point that above the superior angle of the scapula often locates a second region of marked tenderness.

During examination, it is only possible to palpate taught band that lie close to the surface in superficially placed muscles. And if a palpable band is snapped by drawing examining finger sharply across it at a trigger point site in a manner similar to that employed when plucking a violin strings it is possible to evoke a transient contraction of the muscle fibers. This local twitch response (LTR) may be either visible or felt under the examine finger. And in same cases it is both seen and felt.

Levator scapulae Trigger points are differentially diagnosed with the condition like scapulo costal syndrome, zygophyseal pain and bursitis.

Levator scapulae trigger point related neck pain is treated conservatively using Non steroidal anti inflammatory drugs, analgesics, Muscle relaxants, Non manual methods like saline injection and Dry needling and manual methods like Myofascial massage, Ischemic compression technique or Manual inhibition technique, Taping, muscle stripping, deep friction massage, vibration, TENS, IFT, Vapocoolant spray

Stretching, Positional release technique, Muscle energy technique, and Strengthening exercises.

Ischemic compression ,technique help to reduce the Trigger points. Trigger points can be deactivated by temporarily occluding their blood supply and causing a reactive hyperemia (Increase blood supply): effectively flusing out the muscle of inflammatory exudates and pain metabolites, breaking down scar tissue, and reducing muscle tone. The muscle is nourished by the extra – flow through of blood, nerve ending are desensitized and scar tissue is broken down so that the muscle fiber can move better.

In this technique pressure is progressively over the trigger point area or Nodule or taut band in the muscle. The pressure is maintained until the tension is released. The pressure is applied by the therapist thumb, finger pad, knuckles and elbow. The pressure is applied 60 seconds maximum but mostly the desired effect is achieved in 10 – 20 sec. repeated for 3or 4 times. Perhaps, moving to another part of the muscle, if the treated area felt looser or softer to touch. stretching, and active exercises are beneficial after the ischemic compression of the technique.

Taping will encourage correct the posture of the upper back and neck. It is currently used by therapist to change muscle tone, more Lymphatic fluids, Correct the posture, Tape can also be used facilitate weakened or lengthened muscles. It can be positioned along the direction of the muscle fiber and pulled together or shorten the tissue. Tape enhance our proprioceptive awareness of the muscles and increase muscle firing. It also used adjunct to the physiotherapy treatment.

1.1 NEED FOR THE STUDY

Levator scapulae trigger point related neck pain occurs mainly in poor posture and overuse injuries of the muscles. Central trigger point in the levator scapulae at the angle of neck is palpated. The lower trigger point tenderness by electrical stimulates which produce pain refer to the neck and back of the shoulder and inter scapular region.

Many treatment have been a recommended various degree of success. But still there is a need to find out the effective conservative treatment for levator scapulae trigger point neck pain.

So the need for the study is to find out the effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related neck pain.

1.2. OBJECTIVE OF THE STUDY

To find out the effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related neck pain

1.3.STATEMENT OF THE PROBLEM

The effectiveness of ischemic compression and taping technique to reduce pain in levator scapulae trigger point related neck pain

1.4 HYPOTHESIS

Null hypothesis

There is no significant difference in pain and Range of motion following taping and ischemic compression technique among levator scapulae trigger point related neck pain subjects.

Alternative hypothesis

There is significant difference in pain and Range of motion following taping and ischemic compression technique among levator scapulae trigger point related neck pain subjects.

1.5.OPERATIONAL DEFINITIONS

Trigger point

A trigger point is a hyper irritable spot associated with a taut band of a skeletal muscle that is painful on compression or skeletal, and that can give rise to a typical reffered pain pattern as well as autonomic phenomenon (Simon et. al. 1999)

Ischemic compression

Ischemic compression technique, pressure is applied slowly and progressively over the trigger point as the tension in the trigger point and its taut band sub sides. The pressure is maintained until the tenderness (or) tension is released.

Taping

Therapeutic taping techniques are techniques that utilize adhesive strapping tape as a component of the management of the patients with musculoskeletal conditions. (compact oxford dictionary 2009)

Tape can be used clinically to reduce strain on damaged tissue provide support to facilitate correct the movement patterns and facilitate or inhibit the muscle activity

II. REVIEW OF LITERATURE

SECTIONS

Section A: Studies on effect of ischemic compression technique for levator scapulae trigger point related neck pain patients.

Section B: Studies on effect of taping technique of levator scapulae trigger point related neck pain patients.

Section C: Studies on Reliability and validity of Visual Analog Scale (VAS) in measuring pain

Section D: Studies on Reliability and validity of Goniometer in measuring Range of Motion (ROM)

Section A

Studies on Effectiveness of Ischemic Compression Technique for Levator scapulae Trigger point Related Neck pain Patients

Auguliera and Martin D.P et al. (2010) In their case study used a 27 years old female patient effectiveness of ischemic compression for deliberate the blockage of blood in trigger point area to increase local blood flow this result so that application of ischemic compression is effective in presents of myofascial trigger point in neck.

Gemmell H. et al. (2007) did a study to determine immediate effect of ischemic compression, trigger point technique and ultra sound on pain. This study was Randomized control trial study in which two treatment group with 15 subjects participated. It concluded that ischemic compression is superior that sham ultra sound.

Penas et al. (2006) did a pilot study to compare the effect of ischemic compression with transverse friction massage for myofascial in neck pain. In their study they include 40 subjects participated. This study concluded ischemic compression technique and transverse massage technique were equally effective in reducing pain and tenderness of neck muscles.

Bosch – Morell et al. (2006) The immediate effect of ischemic compression as a trigger point therapy in a case of a patient with neck pain. The application of ischemic compression is a safe and effective method to successfully treat elicited myofascial trigger point. The purpose method is deliberate the blockage of blood in trigger point area in order to increase blood flow. This washes away the waste products supplies necessary oxygen and helps the affected tissue heal. The physical examination is revealed of neck pain and stiffness in the neck muscle.

Fernandez - de - las - penas et al. (2004) A first systemic review analysing the effectiveness of manual therapies in the management of trigger points found that few studies had analysed manual interventions for trigger points follow up studies have found that ischemic compression technique is effective in reducing pain sensitivity on latent and active trigger point as well as pain elicited by active trigger point in patient with neck pain we have recently shown that neuromuscular approaches are also effective for reducing pain sensitivity in latent trigger point.

Nowicki et al. (2000) This technique of ischemic compression followed by stretching provided the best and most effective decrease in trigger point.

Travell, Simon et al. (1999) Ischemic compression technique is non-invasive and seems to be free of adverse effects if applied after accurate diagnosis with knowledge of regional anatomy. This technique can be used as a prophylactic or preventive measures.

The virture of this technique is that is painless and imposes no additional strain on attachment trigger point and there by avoids and aggravate them.

Hanten et al. (1997) Reported that stretching techniques reduce the intensity of reffered pain and reduced the sensitivity of the trigger points treated. Many other authors recommended that stretching alone is not enough but it is helpful as an adjunct to ischemic compression.

Travell and Simon et al. (1983) In this ischemic compression technique, pressure is applied slowly and progressively over the trigger point as the tension in the trigger point and its taut band subsides pressure is maintained until the tenderness (or) tension is released. This is followed by stretching the muscle.

Sola et al. (1980) This “stiff neck” muscle, when involved consistently limits neck rotation due to pain on movements. If trigger points are active enough, they refer severe pain even at rest.

Section B

Studies on effect of taping technique of levator scapulae trigger point related neck pain patients.

John Gibbons et al. (2012) Neck pain can be caused by a number of factors including muscle strain, ligament sprain, arthritis or a pinched nerve. Neck pain most successfully treated by taping technique include cervical strain and cervical myofascial pain. Myofascial pain in the neck can develop after trauma or within the medical conditions such as physical stress, depression or insomnia. Tape alleviates pain by providing support and increased circulation around the affected area allowing for rapid recovery.

Thelen et al. **(2008)** Taping has become a widely used rehabilitation modality for the prevention and treatment of musculoskeletal conditions. It alleviates pain and improving healing in soft tissue.

Niddam et al. (2007) The Taping technique claims four effects :to normalize muscular functions, to increase lymphatic and vascular flow, to diminish pain and aid in correction of possible articular mal alignments. This taping technique is frequently applied for pathologies in musculoskeletal system, especially in the field of sport injuries.

Jaraczewska and Long et al. (2006) Their study concluded that tape provides proprioception feedback to achieve postural alignment and joint position. Muscle facilitation is another hypothesized benefit of application of tape.

Hammer et al. (2006) It is proposed that applying taping from the muscle origin to insertion will produce a concentric pull on the fascia, stimulating increased muscle contraction. To facilitate an eccentric or diminished contraction believed to occurs from an eccentric pull on underlying fascia, application of tape from insertion to origin is recommended.

Julie Webe et al. (2005) Tape provide gentle tissue sheering all the day before providing beneficial analgesic effect on the area in addition the tape gives as feedback to prevent painful and improper positioning. Tape can also used to facilitate muscle, inhibit a muscle or provides structural support to the joint.

Leon Chaitow et al. (2003) Tape can provide an analgesic effect by stimulation of receptor in the skin as well as helping the client by providing feedback when the client goes into a poor posture or incorrect posture.

Reimaan and Lephart et al. (2002) It is proposed that cutaneous mechanoreceptors are stimulated by the stretch upon tape application which conveys information regarding joint movement and position.

Lewit et al. (2000) In their case study Levator scapulae trigger point is treated by the application of taping to the computer workers. The taping application is very effective to alleviates pain and correct the posture.

Section C

Studies on Reliability and Validity of Visual Analog Scale (VAS) in measuring pain.

Williamson and Hoggart et al. (2005) The Visual Anologue Scale while uses a 10 cm blank line. The patent asked to record their pain level on the line where one end is indicative of ‘ no pain’ and other is indicative of the ‘worst imaginable pain’. This scale need to be delivered in a written format and consistency in its delivery to be being in either a horizontal (or) a vertical line is necessary.

Anna Maria Carlsson et al. (2008) The Visual Analog Scale is simple and frequently used method for of variation in intensity of pain. In clinical practice the percentage of pain relief, assessed by Visual Analog Scale, is often considered as a measure of efficacy of treatment. However as illustrated in the present study the validity of Visual Analog Scale estimates performed by patients with chronic pain may be unsatisfactory. Two type of Visual Analog Scale, an absolute and a comparative scale. Where comparative with respective factor influencing the reliability and validity of pain estimate.

Mark et al. (2003) The Visual Analog Scale also demonstrated present pain intensity and change in pain intensity in association with performance status, diagnosis, setting, psychological distress and global quality of life. Visual Analog Scale also analysed with umerical ratings scale, box scale, or verbal rating scales. Visual Analog Scale is one of the easiest method to access pain intensity.

Lisa Janice et al (2002) Validity is generally seen as the most important consideration in the evaluation of a measure. Visual Analog Scale used because easily administered

and requires little to no training or equipment however it has several limitation in clinical use. It is likely that this represents a significant reduction of pain but we cannot determine the percentile using Visual Analog Scale score. The FACES scale is an adaptation of Visual Analog Scale for children.

John Gallagher et al. (2000) Realiability of Visual Analog Scale for acute pain measurement as assed by the ICC appears to be high. Ninety percent of pain rating were reproducible with in 9 mm. These data that the Visual Analog Scale is sufficiently reliable to be used to assess acute pain.

Section D

Studies on Reliability and validity of Goniometer in measuring Range of Motion (ROM)

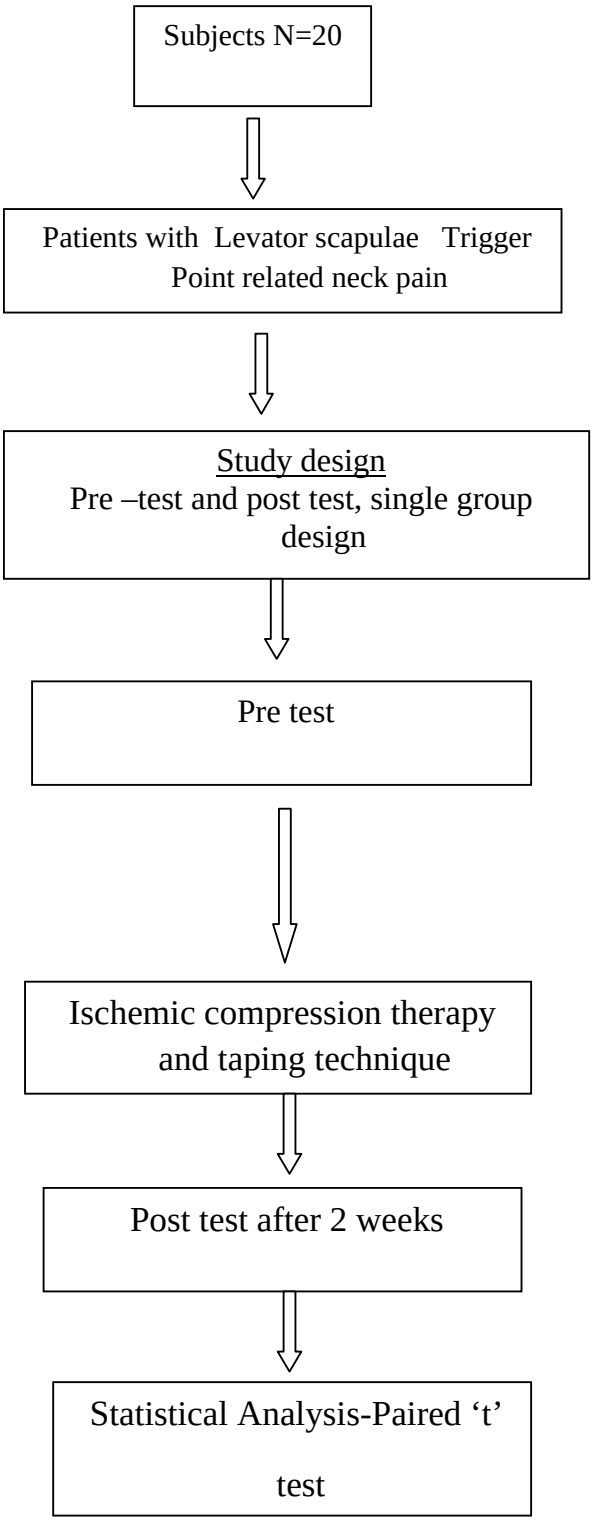
Richard L. Gajdoslk et al. (2008) clinical measurement of range of motion is a fundamental evaluation procedure with ubiquitous application in physical therapy objective measurement of range of motion and correct interpretation of the measurement result can have a substantial impact on the development of the scientific basis of therapeutic intervention. The purpose of this article is to review the related literature on the reliability and validity of goniometric measurement of the area.

Poussa M.S et al. (2005) according to the cervical Range of Motion (ROM) Reliability measurement via the goniometer and excellent inter examinar Reliability for most of the movement evaluated.

Bevilaqua – grossi et al. (2003) Range of Motion (ROM) evaluation has been widely used to quantity musculoskeletal deficits, besides serving as a basics for evaluating efficacy of therapeutic intervention. One of the most common musculoskeletal dysfunction in the population is dysfunction of cervical spine.

Chen et al. (2000) who conducted a review to compare studies on cervical spine Range motion with different measurement equipment. They reported that in most of the studies on adult population, women presented high cervical spine values.

III. METHODOLOGY



3.1. STUDY DESIGN

- The study design consists of experimental group with pre test and post test evaluation.

3.2 SAMPLE DESIGN

- Sample is selected by using consecutive sampling techniques.

3.3. SAMPLE POPULATION

- The sample population include 20 patients.

3.4 STUDYSETTING

- Kumar Ortho hospital, Nagercoil

3.5 STUDY DURATION

- 6 months

3.6 CRITERIA FOR SELECTION OF SUBJECTS

3.6.1 Inclusion criteria

- Age : 20 - 40
- Gender : Male and Female
- Active and palpable myofascial trigger point on one side of the neck of levator scapulae.

3.6.2. Exclusion criteria

- More than 45 years
- Clinical evidence of myelopathy or Radiculopathy
- Fracture or dislocation of cervical vertebrae
- Recent Neck and Shoulder Surgery patient
- Nonco – operated patients
- Mentally retarded patient
- Hyper sensitivity patient
- Tumours of neck and shoulder
- Skin infection like dermatitis
- Loss of sensation
- Open wounds in levator scapulae area

3.7 VARIABLES

3.7.1. Independent variables

- Ischemic compression technique
- Taping technique

3.7.2 Dependent variables

- Pain
- Range of Motion(ROM)

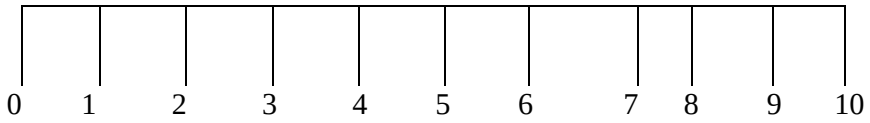
3.8 ASSESSMENT TOOL

- Visual Analog Scale (VAS)
- Goniometer

3.9 MEASUREMENT PROCEDURE

3.9.1 Visual analogue scale

Visual anolog scale is used to measure the severity of pain response that patients experience immediately after the completion of treatment.



(No pain) (severe pain)

It consists of 10 cm horizontal line labled as no pain (0) and severe pain(10).

The patients correspond to the severity of pain patient's experience.

3.9.2. GONIOMETER

Patient position – Sitting position

Axis – Vertex of the skull

Movable arm – tip of the nose

Stable arm – Imaginary connect the patients to acromian process

Procedure : Asking to turned the head of the patient activity and the range of motion measured by the therapist.

3.10. TREATMENT PROCEDURE

Treatment procedure:

3.10.1 Ischemic compression technique

Patient position is supine lying or sitting position. The therapist relax the muscle first for palpating the trigger point. After locating the trigger point, a firm digital or knuckle compression applied to that area. The pressure will be gentle at the beginning and then gradually progress deeper into the tissue, but it not hurt patient.

Figure – 1 shows the techniques of ischemic compression therapy

The ischemic compression will be maintained for 5 seconds and released for 2-3 second small amount of talcum powder will be applied over the trigger point, before the procedure in order to reduce the noxious skin friction. After this method will be brought t**o** the position of comfort, following which unilateral stretching of levator scapulae will be done.

3.10.2. Taping technique

- First clean skin with alcohol and lay down non-sticky tape (typically DonJolly fix tape) perpendicular to the levator scapulae muscle or remove the hair of the part.
- Relax the levator scapulae muscle and palpate tender points.
- lay one end of the tape at the lateral aspect of the clavicle near the acromion clavicular joint.
- Pull the tape towards the medial aspect of the scapulae, pull tight to obtain wrinkles in the skin.
- Apply end of tape at the medial border of the scapulae.
- Start lateral aspect of the scapula and end just medial to the spine.

IV. DATA ANALYSIS AND RESULT

4.1. DATA ANALYSIS

The data collected from 20 subjects were evaluated statistically.

Descriptive analytical study was done by using Paired 't' test.

Paired 't' test

$$\bar{d} = \frac{\sum d}{n}$$

$$S = \sqrt{\frac{\sum d^2 - \frac{\left(\sum d\right)^2}{n}}{n-1}}$$

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

Where,

d – Difference between pre test and post test values

—– Mean of difference between pre test and post test values

n – Total number of subjects

s – Standard deviation

4.2 DATA ANALYSIS AND INTERPRETATION

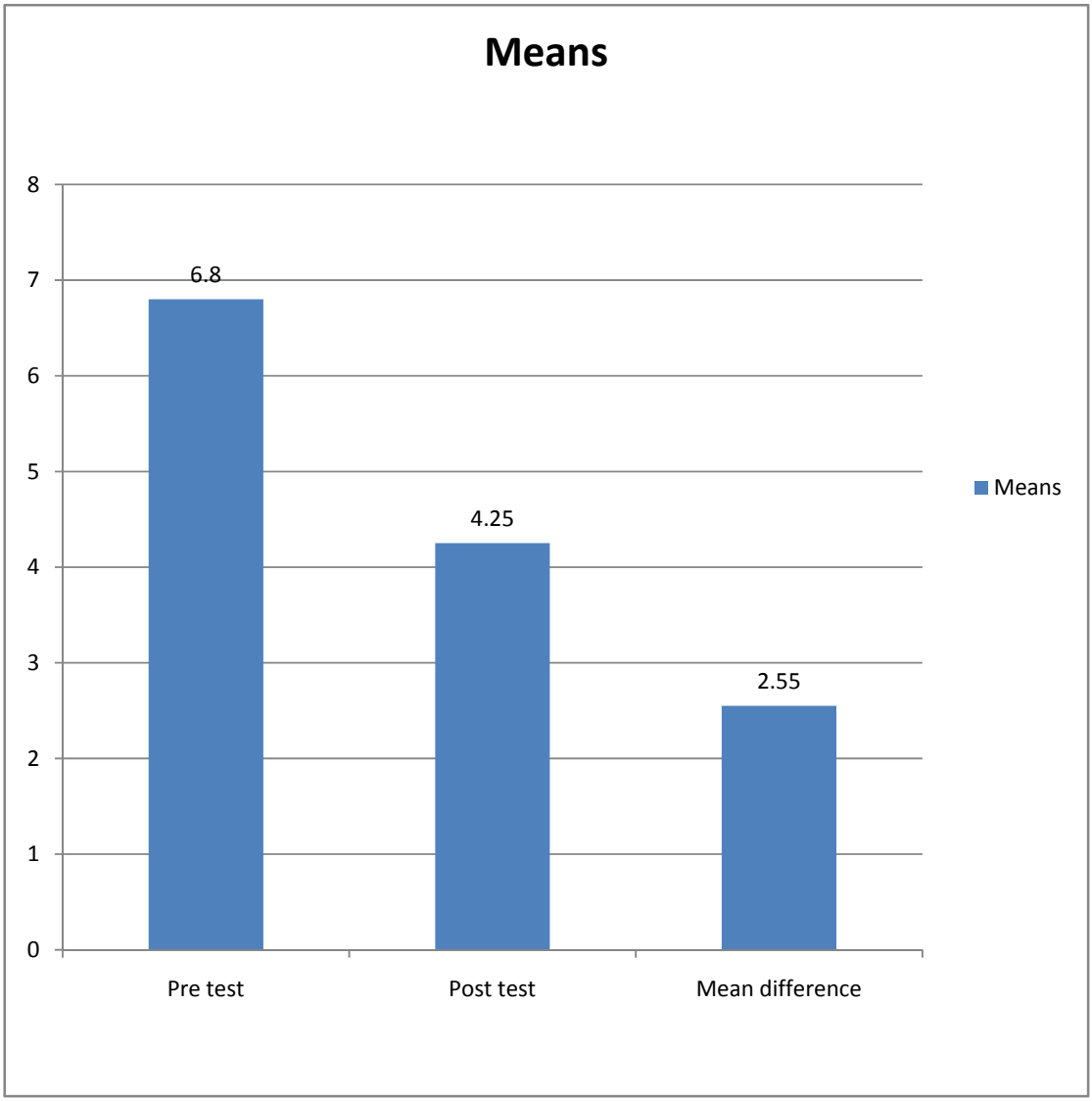
4.2.1 Data analysis of pain measurement

The tables -1 shows difference between the pre test and post test values of experimental group recorded pain measurement by using Visual Analogue Scale (VAS)

Visual Analogue Scale				
Measurement	Mean	Mean difference	Standard deviation	'p' value
Pre test Post test	6.8 4.25	2.55	1	11.40

The 't' test value for pre test and post test datas of experimental group was 11.40 and the table value was 2.861 at 0.005 level of significance. This shows that there exist a significance difference between pre test and post test valued of experimental group.

Figure: 1 Graphical representation of Mean and Mean difference of Visual Analogue Scale



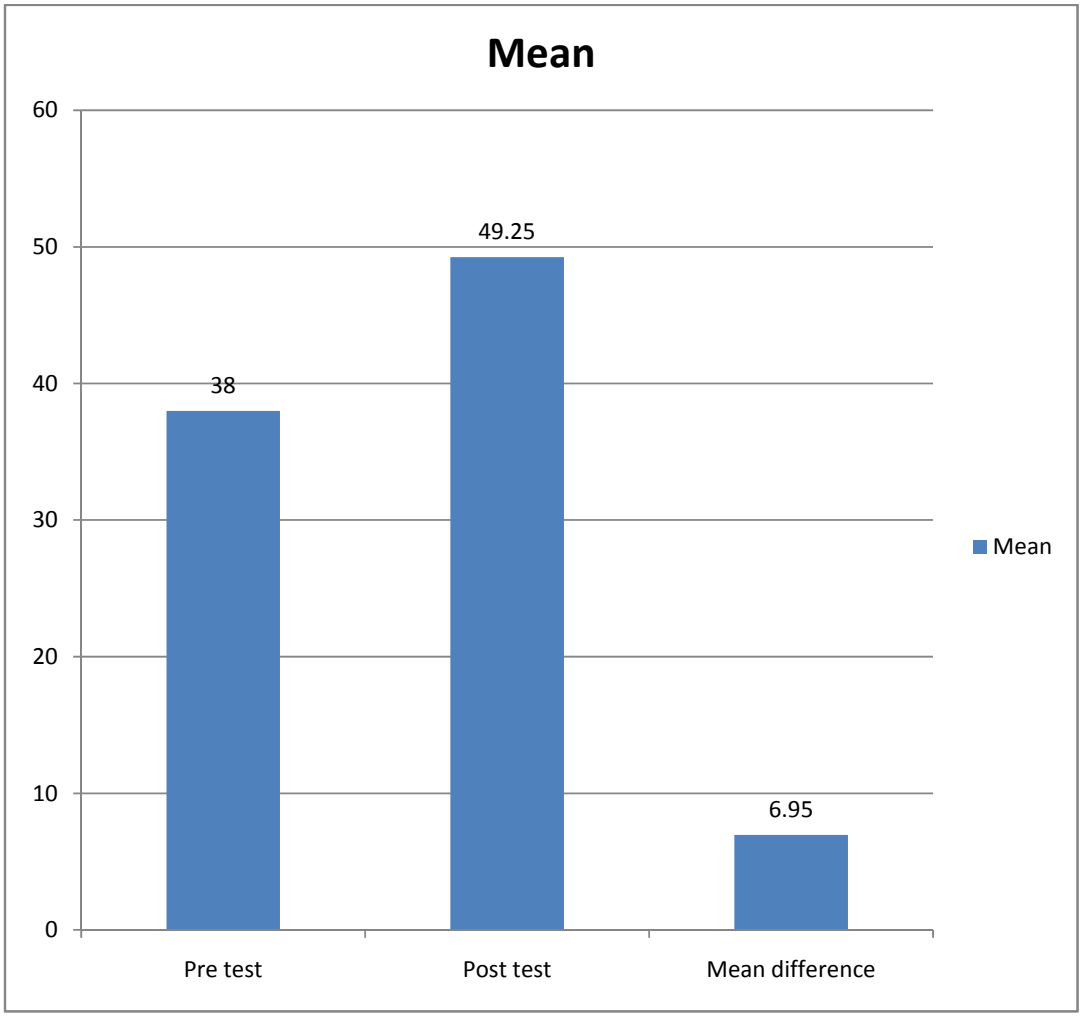
4.2.2. Data analysis of Active Range of Motion of cervical rotation

The tables showing difference between the pre test and post test values of experimental group recording active range of cervical rotation by using Goniometer.

Goniometer				
Measurement	Mean	Mean difference	Standard deviation	Paired 't' test value
Pre test Post test	38 49.25	11.25	6.95	7.23

The 't' test value for pre test and post test datas of experimental group was 7.23 and the table value was 2.861 at 0.05 level of significance. This shows that there exist a significance difference between pre test and post test valued of experimental group.

Figure: 2 Graphical representation of Mean and Mean difference of Active Range of Motion of cervical pain measured by goniometer.



4.3 RESULTS

The number of twenty(20) subjects were selected based on the selection criteria and underwent pre test assessment by visual Analog Scale and goniometer to measure pain and active Range of motion of cervical rotation respectively. The subject were treated with ischemic compression and taping technique for two weeks. After the intervention the post test measures were measured.

In the statistical analysis, the calculated t value for the Visual Analog Scale was 11.40 which is greater than the table value 2.861 at 0.005 level. The active Range of Motion measurement the calculated t value is 7.23 which is greater than the table value 2.861 at 0.005 level of significance. Hence, the calculated t value for pain and Active Range of Motion is more than the table value, the above values shows there is significant difference in both Pain and Active Range of Motion after the ischemic compression and taping techniques.

V. CONCLUSION

An experimental study was conducted to investigate the effectiveness of Ischemic compression and taping technique to reduce pain in levator scapulae related neck pain patients.

20 patients were selected in this study consecutive manner. The levator scapulae trigger point pain assessed by Visual Analogue Scale. The limited Range of Motion of cervical pain assessed by goniometer.

The statistical result shows that the ischemic compression and taping technique is effective for the reduction of pain in levator scapulae trigger point related neck pain patients

5.1 Limitations

This study was very short term and therefore to make it more valid long term is necessary.

Since the study has been done with smaller number of subjects further studies should be conducted the large group of population.

5.2 Recommendation

- Number of subjects may be increased,
- More research in both interventions with consistent outcome measures,
- Study can be done with different variables.

VI. BIBLIOGRAPHY

1) Simons DG, Travell J, Simons LS. (1999) Myofascial Pain and Dysfunction: The Trigger Point Manual. 2nd ed. Volume 1. Baltimore, MD: Williams & Wilkins.
2) Burnstock G. (2002) Structural and chemical organization of the autonomic neuroeffector system. In: Bolis CL, Licinio J, Govoni S, editors. Handbook of the Autonomic Nervous System in Health and Disease. New York: Marcel Dekker.
3) Macefield VG,Wallin BG.(1995) Modulation of muscle sympathetic activity during spontaneous and artificial ventilation and apnœa in humans. J Auton Nerv Syst.
4) Fernández-de-las-Peñas C, 2005). Manual therapies in the myofascial trigger point treatment: A systematic review. J Bodywork Mov Ther.
5) Fryer G, Hodgson L (2005) The effect of manual pressure release on myofascial trigger points in the upper trapezius muscle. J Bodywork Mov Ther.
6) Fernández-de-las-Peñas C, Alonso-Blanco (2006) The immediate effect of ischemic compression technique and transverse friction massage on tenderness of active and latent myofascial trigger points: A pilot study. J Bodywork Mov Ther.
7) Gemmell H, Miller P, Nordstrom H. (2008) Immediate effect of ischæmic compression and trigger point pressure release on neck pain and upper trapezius trigger points: A randomized controlled trial. Clin Chiropr.
8) Ibáñez-García J, Alburquerque-Sendín F, Rodríguez-Blanco C, et al. (2009)Changes in masseter muscle trigger points following straincounter/strain or neuro-muscular technique. J Bodywork Mov Ther.
9) Fernández-de-las-Peñas C, Fernández-Car-nero J, Galán-del-Río F, (2004) Are myofascial trigger points responsible of restricted range of motion? A clinical study (abstract) J Musculosk Pain.
10) Rodríguez-Blanco C, Fernández-de-las-Pe-ñas C, (2006) Changes in active mouth opening following a single treatment of latent myofascial trigger points in the masseter

muscle involving post-isometric relaxation or strain/counterstrain. J Bodywork Mov Ther. ;10:197–205.

11) Vernon H, Schneider M. (2009) Chiropractic management of myofascial trigger points and myofascial pain syndrome: A systematic review of the literature. J Manipulative Physiol Ther.

12) Shah JP, Phillips TM, Danoff JV, Gerber LH. (2005) An in vitro micro-analytical technique for measuring the local biochemical milieu of human skeletal muscle. J Appl Physiol.

13) Howing JL, Gross A, Gasner D, et al. (2001) A critical appraisal of review articles on the effectiveness of conservative treatment for neck pain. Spine.

14) Jette DU, Jette AM.(1997) Professional uncertainty and treatment choices by physical therapists. Arch Phys Med Rehabil.

15) Triano JJ. (2001) Biomechanics of spinal manipulative therapy. Spine J.

16) Fernández-de-las-Penas C, (2005) Validity of the lateral gliding test as a tool for the diagnosis of inter-vertebral dysfunctions in the lower cervical spine. J Manipulative Physiol Ther.

17) Fernández-de-las-Peñas C, Downey C, (2005) Immediate changes in radiographically determined lateral flexion range of motion following a single cervical HVLA manipulation in patients presenting with mechanical neck pain: A case series. Int J Osteopath Med.

18) Martínez et al. (2006) Immediate effects on neck pain and active range of motion a"er a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: A randomized controlled trial. J Manipulative Physiol Ther.

19) Vernon H, Humphreys K, Hagino C. (2007) Chronic mechanical neck pain in adults treated by manual therapy: A systematic review of change scores in randomized clinical trials. J Manipulative Physiol Ther.

20) Lucas KR, Polus BI, Rich PA.(2004) Latent myofascial trigger points: Their effects on muscle activation and movement efficiency. J Bodywork Mov Ther.

21) Gerwin RD, Dommerholt D, Shah JP. (2004) An expansion of Simons' integrated hypothesis of trigger point formation.Curr Pain Head Reported.

22) McPartland JM, Simons DG.(2006) Myofascial trigger points: Translating molecular theory into manual therapy. J Man Manipulative Ther.

23) Simons DG. (2001)Do endplate noise and spikes arise from normal motor endplates? Am J Phys Med Rehabil.

24) Couppé C, Midttun A (2001) Spontaneous needle electromyographic activity in myofascial trigger points in the infraspinatus muscle: A blinded assessment. J Musculosk Pain.

25) Simons DG, Hong CZ (2002)Endplate potentials are common to midfiber myofascial trigger points. Am J Phys Med Rehabil

26) Ge HY et al., (2006) Sympathetic facilitation of hyperalgesia evoked from myofascial tender and trigger points in patients with unilateral shoulder pain. Clin Neurophysiol.

VII ANNEXURE

Annexure- I

ASSESSMENT CHART

Physical therapy assessment chart

Name

Age

Gender

Occupation

Chief complaints

Medical history

- Past
- Present

Family history

Social history

Associated problems

On observation

- Body Built
- Posture
- Attitude of limbs
- Muscle wasting
- Edema
- Involuntary movement

- Gait
- Deformity

On palpation

- Tenderness
- Swelling
- Muscle tightness
- Warmth

Pain assessment

- Side
- Site
- Duration
- Nature
- Aggravating factor
- Relieving factor
- Other if any

On examination

- Vital signs
- Motor Assessment
    - Range Of Motion
    - End Feels
    - Manual Muscle Testing
    - Joint Positions

- Sensory Assessment
    - Superficial Sensations
    - Deep Sensations

    - Combined
- Reflexes
    - Superficial
    - Deep
    - Clonuses
- Dermatomes and Myotomes
- Limb Length Discrepancies
- Special Tests
- Functional Assessments
- Gait Assessments

Investigations

Clinical Impression

Differential Diagnosis

Final Diagnosis

Goals

- Short Term Goals
- Long Term Goals

Treatment Plan

- Electrotherapy Modalities
- Manipulations
- Exercise Therapy
- **Home Program me**

ANNEXURE – II

RAW DATAS

Table: 7.2 Pre and post-test Visual Analog Scale values of Pain

Serial .No	Pre test	Post test	Difference (d)	Difference squared (d^2)
1	8	7	1	1
2	6	4	2	4
3	6	5	1	1
4	7	4	3	9
5	7	5	2	4
6	5	2	3	9
7	8	6	2	4
8	7	5	2	4
9	6	8	3	9
10	8	5	3	9
11	7	4	3	9
12	7	5	2	4
13	6	3	3	9
14	6	2	4	16
15	5	3	2	4
16	8	5	3	9
17	6	2	4	16
18	7	4	3	9
19	8	5	3	9
20	8	6	2	4

Table: 7.2 Pre and post-test Goniometer Range of Motion values of Pain

Serial. no	Pre test	Post test	Difference (d)	Difference squared (d^2)
1	35	45	10	100
2	30	50	20	400
3	40	55	15	225
4	50	55	5	25
5	45	50	5	25
6	40	50	10	100
7	25	45	20	400
8	50	55	5	25
9	40	45	5	25
10	30	55	25	625
11	40	45	5	25
12	50	60	10	100
13	45	60	15	225
14	35	40	5	25
15	25	50	25	625
16	40	55	15	225
17	25	35	10	100
18	50	55	5	25
19	35	45	10	100
20	30	35	5	25

ANNEXURE- III

PATIENT CONSENT FORM

I ……aged……yrs, voluntarily consent to participate in the research named **"Effectiveness of ischemic compression technique and taping technique to reduce pain in levator scapulae trigger point related neck pain"**

The researcher has explained me the treatment approach in brief, risk of participation and has answered all the questions pertaining to the study to my satisfaction.

Signature of Subject **Signature of Researcher**

Signature of Witness

Figure -2 shows levator scapulae trigger point

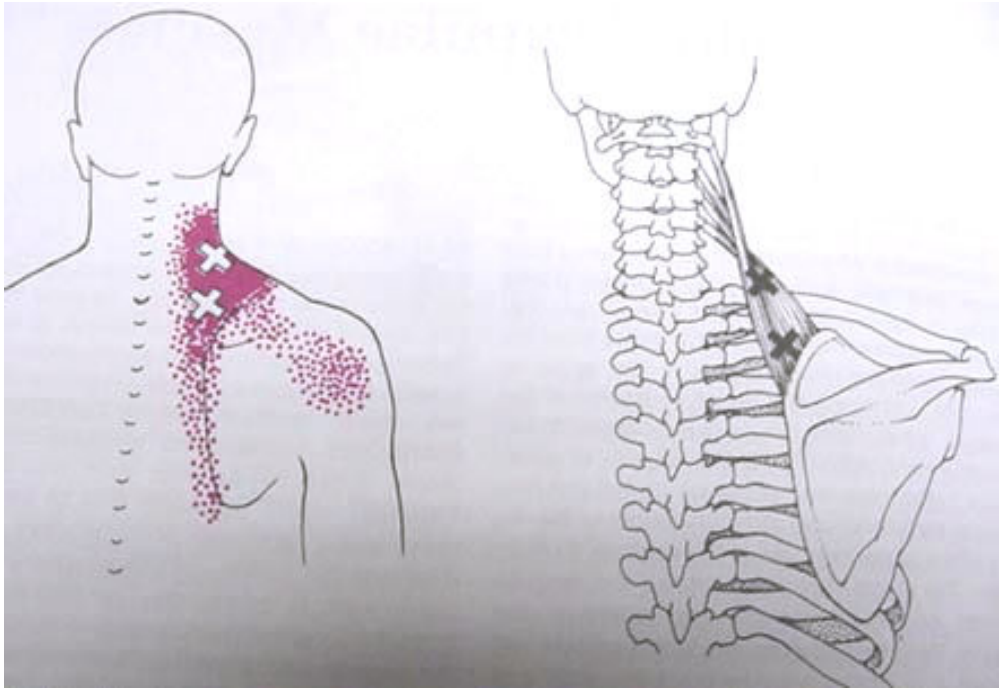


Figure -3 shows taping application of levator scapulae trigger point related neck pain